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# Influence of Risk and Community Setting on Kindergarten Children's Development

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**Abstract**

This study examined differences in kindergarten children's behavioral functioning across rural and non-rural communities, as well as explored the effect of risk in each setting (i.e., rural, non-rural) on these children's behavior. Data from 116 kindergarten students and their parents and teachers was analyzed. Multilevel modeling was used to explore the main and interaction effects of community setting and cumulative risk on parent and teacher reports of children's behavioral functioning. Findings suggested that community setting or cumulative risk did not predict kindergarten children's behavior; however, risk differentially predicted children's behavior based on rural or non-rural community status. Particularly, cumulative risk predicted poorer student outcomes upon entrance in kindergarten in rural communities than non-rural communities. Limitations of the study and implications for practice are discussed.

## **Background**

### **Behavioral Challenges**

- Childhood behavior problems often occur across multiple settings (Achenbach, McConaughy, & Howell, 1987).
- Left unaddressed, young children with problem behaviors are vulnerable to negative outcomes later in life.
  - Low achievement scores and academic grades (Bub, McCartney, & Willett, 2007; Lopes, 2007)
  - Increased school suspensions (Reinke, Herman, Petras, & Ialongo, 2008)
  - High school dropout (Vitaro, Brendgen, Larose, & Tremblay, 2005)
- Early intervention is necessary to reduce children's externalizing behaviors and build their adaptive skills (Denham, 2006; Grusec & Davidov, 2010).

### **Transition to Kindergarten**

- Children often experience academic, social, and cultural discontinuities when transitioning into kindergarten (Christenson, 1999).
- More than any other school readiness skill, young children's behavioral problems are rated as most concerning to kindergarten teachers (Rimm-Kaufman & Pianta, 2000).
- The environmental context and the relationships between them are important when examining children's transitions to kindergarten.

### **Environmental Context**

- Ecological theory emphasizes the importance of person-environment fit (Bronfenbrenner, 1979).
- Optimal development occurs when:
  - Environments are conducive to social, behavioral, and academic success
  - Coordination exists between the key environments
- Early academic and behavior problems are influenced by community setting and socio-demographic factors.

## **Community Factors**

- Rural and non-rural communities differ in ways that may impact children's development (Evans, 2006):
  - Resource accessibility  
Economic characteristics  
Collective human, social, and cultural capital
  - Students in large urban and rural communities come to kindergarten less academically prepared than their small urban and suburban counterparts (Miller & Votruba-Drzal, 2013).

## **Socio-Demographic Factors**

- Certain socio-demographic factors place children at risk for academic and behavioral challenges.
- Exposure to multiple risk factors impacts children more than individual risk factors (Evans, Whipple, & Li, 2013).
- Socio-demographic risk factors include fewer than two adults in the home, maternal education less than high school degree, free and reduced lunch eligibility, and language differences between home and school.

## **Cumulative Risk**

- Cumulative risk is defined as the total number of risk factors experienced by a child.
- Early exposure to risk factors predicts children's behavior problems (Appleyard, Egeland, van Dulmen, & Sroufe, 2005). Children who experience more risk factors have been found to exhibit poorer behavior (Sheridan et al., 2012).
- Understanding the cumulative risk factors that children experience is crucial when choosing appropriate interventions.
  - Interventions targeting multiple risk factors, rather than individual risk factors, are recommended (Evans, Whipple, & Li, 2013).

## Research Questions

1. Does community setting predict parent and teacher reports of kindergarten students' behavior?
2. Does cumulative risk differentially predict kindergarten students' behavior based on rural or non-rural community status?

## Method

### Participants

- Participants were drawn from two randomized controlled trials
- 116 kindergarten students *identified as having disruptive behaviors* and their parents (see Tables 1 and 2)
- 62 teachers (see Table 3)
- 40 schools
  - 10 mid-size city Nebraska schools
  - 30 rural schools in Nebraska and surrounding communities

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Table 1  
*Student Demographics*

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		Rural (n=66)	Non-Rural (n=50)
Mean (SD) Age		5.53 (.54)	5.23 (.48)
Gender (Male)		84%	100%
Disability Status		40%	54%
Ethnicity	White, non-Hispanic	84%	77%
	African American	2%	4%
	Hispanic/Latino	6%	6%
	Other	8%	13%
Risk Factors	0	28%	50%
	1	49%	36%
	2	10%	12%
	3 or more	13%	2%

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Table 2  
*Parent Demographics*

		Rural (n=66)	Non-Rural (n=50)
Free/Reduced Lunch (Eligible)		69%	36%
Gender	Male	10%	11%
	Female	90%	89%
Education	Less than HS diploma	11%	9%
	HS diploma or GED	15%	11%
	Some college	44%	25%
	College degree	29%	38%
	Graduate coursework/Degree	6%	17%

Table 3  
*Teacher Demographics*

		Rural (n=39)	Non-Rural (n=23)
Gender (Female)		97%	100%
Ethnicity (White)		100%	96%
Education	College degree	28%	43%
	Some graduate coursework	46%	48%
	Graduate degree	26%	9%
Mean Years Teaching		14	8
Certification	General education	87%	78%
	General & Special education	23%	22%

## Measures

- Student Behavior
  - Parent and teacher report on broadband scales (Behavioral Symptoms Index, Internalizing Problems, Adaptive Skills) of *Behavior Assessment System for Children* (Reynolds & Kamphaus, 2004)
- Cumulative Risk
  - Total number of parent reported socio-demographic risk factors experienced by a child:
    - Fewer than two adults in the home
    - Maternal education less than high school degree
    - Free and reduced lunch eligibility
    - Language differences between home and school
- Community Setting
  - Rural communities across three Midwestern states
  - Moderately-sized city in Nebraska
- Disability Status
  - Parent report of mental health diagnosis
  - Parent report of psychotropic medication use
  - Teacher report of special education eligibility

## Data Analysis

- Multilevel models of students and their parents nested within teachers was conducted to examine whether community setting predicts parent and teacher reports of kindergarten students' behavior (main effects) and whether cumulative risk differentially predicts parent and teacher reports of kindergarten students' behavior based on community type (interaction effects)



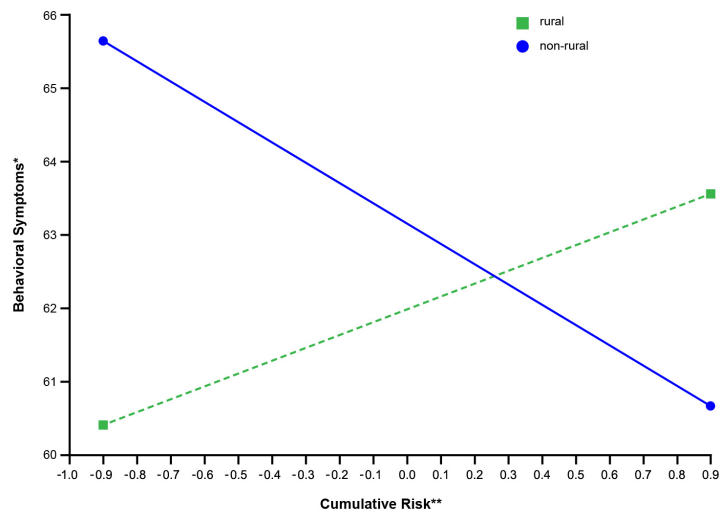
## Results

1. Does community setting predict parent and teacher reports of kindergarten students' behavior (main effects)?

- There were no significant differences between reports of rural and non-rural kindergarten students' behavioral functioning.

2. Does cumulative risk differentially predict kindergarten students' behavior based on rural or non-rural community status (interaction effects; see Table 4 for complete list of significant interaction effects)?

- Setting matters when determining whether the number of risk factors experienced by kindergarten students and their family predicts their behavioral functioning.
- Effect of risk on teacher reports of students' **behavioral symptoms** varies as a function of community ( $p=.03$ ; see Figure 1).
  - As non-rural students' cumulative risk increases, teachers report fewer challenging behaviors. As rural students' cumulative risk increases, teachers report they display more challenging behavior.



*Figure 1.* Interaction graph for the effect of teacher-reported behavioral symptoms by community setting and cumulative risk. \*Behavioral Symptoms measured on the teacher-reported BASC; \*\*Cumulative Risk scores totaled and centered.

- Effect of risk on teacher reports of students' **adaptive skills** varies as a function of community ( $p=.008$ ; see Figure 2).
  - As non-rural students' cumulative risk increases, teachers report they have more adaptive skills. As rural students' cumulative risk increases, teachers report they have fewer adaptive skills.

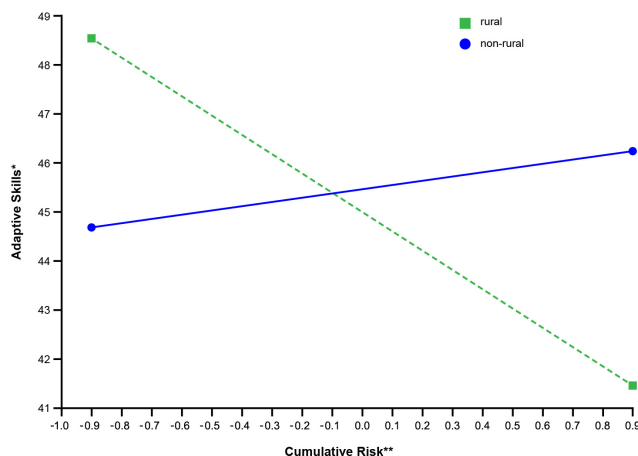


Figure 2. Interaction graph for the effect of teacher-reported adaptive skills by community setting and cumulative risk. \*Adaptive Skills measured on the teacher-reported BASC; \*\*Cumulative Risk scores totaled and centered.

- Effect of risk on parent reports of children's **internalizing problems** varies as a function of community ( $p=.008$ ; see Figure 3).
  - As non-rural students' cumulative risk increases, their parents report they have fewer internalizing difficulties. As rural students' cumulative risk increases, their parents' report they have more internalizing difficulties.

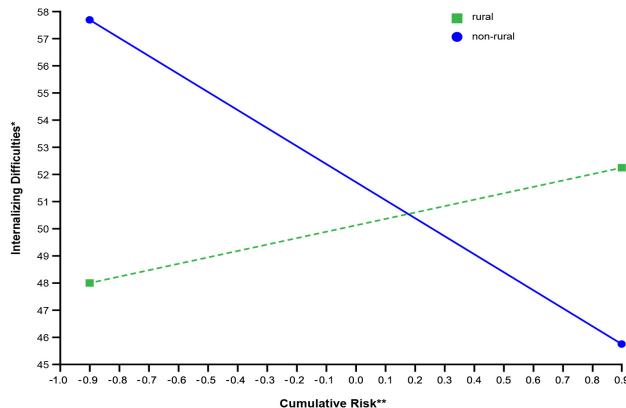


Figure 3. Interaction graph for the effect of parent-reported internalizing problems by community setting and cumulative risk. \*Internalizing Difficulties measured on the parent-reported BASC; \*\*Cumulative Risk scores totaled and centered.

Table 4

*Significant Interaction<sup>a</sup> Effects*

BASC Outcomes	F-value	p-value	Effect Size <sup>b</sup>
<b>Teacher Report</b>			
Behavioral Symptoms Index	5.68	0.023	0.166
Adaptive Skills	8.64	0.008	0.253
Withdrawal	11.82	0.003	0.562
Adaptability	3.60	0.070 <sup>c</sup>	0.053
<b>Parent Report</b>			
Behavioral Symptoms Index (Parent)	3.10	0.94 <sup>c</sup>	0.051
Internalizing (Parent)	8.71	0.008	0.136
Anxiety (Parent)	4.95	0.038	0.060
Withdrawal (Parent)	3.36	0.081 <sup>c</sup>	0.053
Somatization (Parent)	4.65	0.044	0.074

Note. <sup>a</sup> Interaction effect between Rural x Risk. <sup>b</sup> Effect sizes represented as Cohen's *f*. <sup>c</sup> Interaction effects that were approaching significance. Risk factors included (a) fewer than two adults in the home, (b) primary language in the home is not English, (c) maternal education level is less than a high school degree, and (d) child is eligible for free or reduced school meals

### General Findings

- Increasing levels of risk functions differently in rural and non-rural settings.
- Risk predicts poorer student outcomes upon entrance in kindergarten in rural communities than non-rural communities.
- Access to services may offset challenges associated with risk.
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### Implications

- Preschool interventions focusing on decreasing problem behaviors and increasing adaptive behaviors are needed.
- To be maximally effective, interventions that address behavioral concerns for children at risk may need to be *context-sensitive*.
- Access to tools and training to augment the skills and competencies of rural parents and teachers are necessary for children exposed to multiple risk factors.
- Strategies that develop *context-sensitive*, cross-system partnerships are effective at building community support for young children's development.

### Limitations

- The overall sample size of rural and non-rural settings is small.
- The rural sample used in this study is not representative of all rural areas.
- Methodological limitations do not allow us determine causation.
- Did not control for multiple tests or test for the significance of the simple slopes.

### Future Directions

- Identify contextual variables that may impact rural children's challenging behaviors in kindergarten.
- Explore early childhood care variables in relationship to context that may influence children's transition to kindergarten.
- Evaluate interventions and community supports in rural communities that may buffer the impact of risk.

### References

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, *101*, 213-232.
- Appleyard, K., Egeland, B., van Dulmen, M. H. M., & Sroufe, L. A. (2005). When more is not better: The role of cumulative risk in child behavior outcomes. *Journal of Child Psychology and Psychiatry*, *46*, 235–245. doi:10.1111/j.1469-7610.2004.00351.x
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bub, K. L., McCartney, K., & Willett, J. B. (2007). Behavior problem trajectories and first-grade cognitive ability and achievement skills: A latent growth curve analysis. *Journal of Educational Psychology*, *99*, 653-670. doi:10.1037/0022-0663.99.3.653
- Christenson, S. L. (1999). Families and schools: Rights responsibilities, resources, and relationships. In R. C. Pianta & M. Cox (Eds.), *The transition to kindergarten: Research, policy, training, and practice* (pp. 143–178). Baltimore, MD: Paul Brooks Publishers.
- Denham, S. A. (2006). Social-emotional competence as support for school readiness: What is it and how do we assess it? *Early Education and Development, Special Issue: Measurement of School Readiness*, *17*, 57-89.

- Evans, G. W. (2006). Child development and the physical environment. *Annual Review of Psychology, 57*, 423-451. doi:10.1146/annurev.psych.57.102904.190057
- Evans, G. W., Li, D., & Sepanski Whipple, S. (2013). Cumulative risk and child development. *Psychological Bulletin, 139*, 1342–1396. doi:10.1037/a0031808
- Grusec, J. E., & Davidov, M. (2010). Integrating different perspectives on socialization theory and research: A domain-specific approach. *Child Development, 81*, 687-709.
- Lopes, J. A. (2007). Prevalence and comorbidity of emotional, behavioral and learning problems: A study of 7<sup>th</sup>-grade students. *Education and Treatment of Children, 30*, 165-181. doi:10.1353/etc.2007.0027
- Miller, P., Votruba-Drzal, E., & Setodji, C. M. (2013). Family income and early achievement across the urban–rural continuum. *Developmental Psychology, 49*, 1452–1465. doi:10.1037/a0030244
- Reinke, W. M., Herman, K. C., Petras, H., & Ialongo N. S. (2008). Empirically derived subtypes of child academic and behavior problems: Co-occurrence and distal outcomes. *Journal of Abnormal Child Psychology, 36*, 759-770. doi:10.1007/s10802-007-9208-2
- Reynolds, C.R., & Kamphaus, R.W. (2004). *Behavior assessment system for children (2nd ed.)*. Circle Pines, MN: American Guidance Service.
- Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology, 21*, 491-511.
- Sheridan, S. M., Bovaird, J. A., Glover, T. A., Garbacz, S. A., Witte, A., & Kwon, K. (2012). A randomized trial examining the effects of conjoint behavioral consultation and the mediating role of the parent-teacher relationship. *School Psychology Review, 41*, 23-46.
- Vitaro, F., Brendgen, M., Larose, S., & Tremblay, R. E. (2005). Kindergarten disruptive behaviors, protective factors, and educational achievement by early adulthood. *Journal of Educational Psychology, 97*, 617-629. doi:10.1037/0022-0663.97.4.617